

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1-13. (canceled).

14. (previously presented): A method of detecting three-dimensional information, comprising:

illuminating an object sequentially with, a first illumination light which has a linearly varying intensity and a second illumination light which has a constant intensity;

acquiring an image of the object illuminated by said two illumination lights such that a rate of change of an image pickup gain is faster than a rate of change of intensity of the first illumination light, wherein the image of the object is acquired at least two times, once during each illumination, and with a same pick-up gain during each illumination by an image pick-up element having storage effect; and

detecting a distance between individual points of the object on the basis of the image obtained; wherein

the distance between respective points of the object is detected at a speed at which three-dimensional image is output in real time, the three-dimensional image being output within a period of time corresponding to one normal image frame of a video signal being received by an image pickup device .

15. (previously presented): A method of detecting three-dimensional information, comprising:

illuminating an object sequentially with a first illumination light which has a linearly varying intensity and a second illumination light which has a constant intensity;

acquiring an image of the object illuminated by said two illumination lights by acquisition of the given level of a image pick-up gain such that a cycle of picking up images is shorter than a cycle of illumination changes, wherein the image of the object is acquired at least two times, once during each illumination, with a same pick-up gain during each illumination, by an image pick-up element having storage effect; and

detecting a distance between individual points of the object on the basis of the image obtained; wherein

the distance between respective points of the object is detected at a speed at which three-dimensional image is output in real time, the three-dimensional image being output within a period of time corresponding to one normal image frame of a video signal being received by an image pickup device.

16. (withdrawn): A method of detecting three-dimensional information, comprising:

illuminating an object with an illumination light;

acquiring an image of the object illuminated by the illumination light by acquisition of at least two image pick-up gain, at least one of said image pick-up gain changing with time, and the image pick-up gain having slower changing rate than a changing rate of the illumination light,

wherein the image is acquired a plurality of times by an image pick-up element having storage effect; and

detecting a distance between individual points of the object on the basis of the image obtained; wherein

the distance between respective points of the object is detected at a speed at which three-dimensional information is followed real time within a period of time corresponding to a frame of a video signal.

17. (withdrawn): A method of detecting three-dimensional information, comprising:
illuminating an object with an illumination light;

acquiring an image of the object illuminated by the illumination light by acquisition of at least two image pick-up gain, at least one of said image pick-up gain changing with time, and the image pick-up gain having slower changing cycle than a illuminating time of the illumination light with given level of intensity, wherein the image of the object is acquired a plurality of times by an image pick-up element having storage effect; and

detecting a distance between individual points of the object on the basis of the image obtained; wherein

the distance between respective points of the object is detected at a speed at which three-dimensional information is followed real time within a period of time corresponding to a frame of a video signal.

18. (previously presented): The method of detecting three-dimensional information as defined in claim 14, wherein

a first and a second optical images of the object illuminated by the first and the second illumination light are formed;

the first and the second optical images are obtained alternately by acquiring the first and the second optical images with a single image pick-up gain over a given period of time;

the first and the second images obtained are stored; and

the distance between respective points of the objects are detected by each of the first and second images and are detected sequentially for each frame of the video signal.

19. (previously presented): The method of detecting three-dimensional information as defined in claim 15, wherein

a first and a second optical images of the object illuminated by the first and the second illumination light are formed;

the first and the second optical images are obtained alternately by acquiring the first and the second optical images with a single image pick-up gain over a given period of time;

the first and the second images obtained are stored; and

the distance between respective points of the objects are detected by each of the first and second images and are detected sequentially for each frame of the video signal.

20. (canceled).

21. (previously presented): The method of detecting three-dimensional information as defined in claim 33, wherein the intensity of the first illumination light is increased with time, and the second illumination light is decreased with time.

22. (canceled).

23. (previously presented): The method of detecting three-dimensional information as defined in claim 34, wherein the intensity of the first illumination light is increased with time, and the second illumination light is decreased with time.

24. (withdrawn): The method of detecting three-dimensional information as defined in claim 16, wherein

first and second optical images of the object illuminated by first and second illumination light which illuminate with single intensity over a predetermined period of time, are formed;

first and second images are obtained alternately by acquiring the first and second optical images with first and second image pick-up gains, the first and second images obtained are stored; and

the distance between respective points of the object is detected from the first and second images which are detected sequentially for each frame of the video signal.

25. (withdrawn): The method of detecting three-dimensional information as defined in claim 17, wherein

first and second optical images of the object illuminated by first and second illumination light which illuminate with single intensity over a predetermined period of time, are formed;

first and second images are obtained alternately by acquiring the first and second optical images with first and second image pick-up gains, the first and second images obtained are stored; and

the distance between respective points of the object is detected from the first and second images which are detected sequentially for each frame of the video signal.

26. (withdrawn): The method of detecting three-dimensional information as defined in claim 16, wherein the first image pick-up gain changes with time, and the second image pick-up gain is uniform.

27. (withdrawn): The method of detecting three-dimensional information as defined in claim 16, wherein the first image pick-up gain is increased with time, and the second image pick-up gain is decreased with time.

28. (withdrawn): The method of detecting three-dimensional information as defined in claim 17, wherein the first image pick-up gain changes with time, and the second image pick-up gain is uniform.

29. (withdrawn): The method of detecting three-dimensional information as defined in claim 17, wherein the first image pick-up gain is increased with time, and the second image pick-up gain is decreased with time.

30- 32 cancelled

33. (previously presented): A method of detecting three-dimensional information, comprising:

illuminating an object sequentially with a first illumination light and a second illumination light, both illumination lights having a linearly varying intensity;

acquiring an image of the object illuminated by at least two illumination lights by acquisition of a image pick-up gain having faster changing rate than a changing rate of the intensity of the illumination lights, wherein the image of the object is acquired a plurality of times by an image pick-up element having storage effect; and

detecting a distance between individual points of the object on the basis of the image obtained; wherein

the distance between respective points is detected at a speed at which three-dimensional image is output in real time, the three-dimensional image being output within a period of time corresponding to one normal image frame of a video signal being received by an image pickup device.

34. (previously presented): A method of detecting three-dimensional information, comprising:

illuminating an object sequentially with at least a first illumination light and a second illumination light, both illumination lights having a linearly varying intensity;

acquiring an image of the object illuminated by said at least two illumination light by acquisition of the given level of a pick-up gain with shorter changing cycle than a changing cycle of the intensity of the illumination light, wherein the image of the object is acquired a plurality of times by an image pick-up element having storage effect; and

detecting a distance between individual points of the object on the basis of the image obtained; wherein

the distance between respective points of the object is detected at a speed at which three-dimensional image is output in real time, the three-dimensional image being output within a period of time corresponding to one normal image frame of a video signal being received by an image pickup device.